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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|-----------------|-------------|----------------------|---------------------|------------------|
| 10/796,049      | 03/10/2004  | Katsuya Sato         | ASA-1172            | 2717             |

7590 01/23/2008  
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ALEXANDRIA, VA 22314

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| EXAMINER |
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FORD, JOHN K

|          |              |
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| ART UNIT | PAPER NUMBER |
|----------|--------------|

3744

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| MAIL DATE | DELIVERY MODE |
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01/23/2008

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

**Office Action Summary**

Application No.

10/796,049

Applicant(s)

SATO ET AL.

Examiner

John K. Ford

Art Unit

3744

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 10/30/07
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1,3,4 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1,3,4 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date 10/30/07
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_

Applicant's response of October 30, 2007 has been carefully considered.

In the previous office action applicant was asked to provide a translation of JP 412629. In his response, applicant corrected the citation to Taiwan 412629 and provided only a translated abstract. Unfortunately the abstract does not provide enough information to allow for an understanding of how the pump 14 and fan 15 are controlled with respect to one another. In response to this office action please provide a complete translation or explain, in appropriate detail, how the pump 14 and fan 15 are actuated with respect to one another and what variable(s) they are responsive to. Is element 16 a temperature sensor? Is the pump 14 actuated first, before the fan 15, responsive to temperature? If not, how does TW 412629 work? Please explain in enough detail to allow meaningful comparison to the claimed subject matter.

Applicant's claims continue to claim many features functionally (without supporting "means for....." recitations). While they are not considered indefinite, these recitations are treated consistent with the guidance set forth in MPEP 2114, incorporated here by reference. Applicant's remarks as to the patentability of the claims are treated in the body of the rejection that follows.

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the

invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1, 3 and 4 are rejected under 35 U.S.C. 103(a) as being unpatentable over JP 2003-314936 in view of Takeda, USP 6,414,843 (Figure 5), Cheng (USP 5,197,858) and, optionally, Algrain, USP 6,352,055 ( Figures 1 and 2).

In JP '936, Figure 2, a heat generating electronic component (CPU) is associated with a heat generating portion (HEX1) and a pump (PM) pumps a liquid cooling medium around a circuit (TB, TB1, TB2) to a heat radiating portion (HEX2) cooled by a fan (FN). To the examiner's knowledge and belief all water containing heat transfer mediums have a viscosity that decreases with increasing temperature. Moreover in paragraph 0058 of the translation of JP '936, the liquid cooling medium is disclosed to be water/microcapsule mixed solution with a latent storage medium that melts at 61.5 degrees C (see paragraph 0034 of the translation for the melting point). Axiomatically, when something melts its viscosity goes down. It is also well known the viscosity of water decreases with increasing temperature (see Li and Lam textbook cited by the examiner in this office action), which forms in part of this rejection except to demonstrate what those of ordinary skill in the art already know.

A temperature sensor Th1 in Figure 3 detects the temperature of the heat generating portion and that signal is processed in a temperature signal processing means Thcal (along with the temperature signal from sensor Th2). Both the fan and

pump speeds are outputted by control means FNcnt (for the fan) and PMcnt (for the pump).

As shown in Figure 4, the control is configured to operate only the pump when the sensed "skin temperature" (i.e. surface temperature) of the CPU exceeds 70 degrees C. When the temperature Tp of the heat exchanger HEX exceeds 80 degrees (which can only occur when the CPU "skin temperature" is above 80 degrees C) the fan is turned on in addition to the pump that is already operating. When the load on the electronic CPU is small the voltage output to both the fan and the pump is zero.

JP '936 does not disclose using look-up tables (predetermined stored information) for fan and pump voltages, but likewise it does not preclude it.

In JP '936, to have used a stored table of fan voltages for a range of temperatures to modulate the fan speed (at block FNcnt of JP '936) and pump speed (at block PMcnt of JP '936) would have been obvious to one of ordinary skill in the art as taught by Takeda in a very clear manner in Figure 5 with respect to how this is done for a fan control, i.e. by storing fan motor voltages as a function of temperature. One of ordinary skill could of course do the same thing with respect to the pump control as evidenced by Algrain et al (USP 6,352,055), Figures 1 and 2, column 3, lines 23-55, incorporated here by reference. Algrain is optionally relied upon if applicant disputes the conclusion reached in the previous sentence. Typically, "look-up" tables having stored values of temperature and motor voltage necessary to produce a certain pump speed are used. Such a computerized feedback control of both fan and pump speed would advantageously allow the designer easy modification of the pre-stored

relationships (e.g. the pump and fan actuation temperatures of 70 and 80 degrees C) versus a hardwired system.

With respect to claim 3, the "critical temperature" in JP '936 is 80 degrees C (i.e. the fan actuation temperature).

With respect to claim 4, Cheng (USP 5,197,858) teaches operating the cooling means of a computer cooling system at full speed if the thermal sensor fails, to prevent the hot electrical component from destroying itself due to excess heat. Since JP '936 needs both the pump and fan to operate to dissipate heat from the CPU, it would have been obvious to have operated both the fan and pump of JP '936 at full speed in the event of temperature sensor failure to keep the CPU from destroying itself due to excess heat under any possible running condition.

The argument that applicant's system is "a different technical idea" is not persuasive because all of the limitations of the claims are met by the prior art. Applicant must limit the claim in some other way for the argument to hold and the examiner is unsure how that would be accomplished in this particular case.

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within

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TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to John K. Ford whose telephone number is 571-272-4911. The examiner can normally be reached on Mon.-Fri. 9-5:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Cheryl Tyler can be reached on 571-272-4834. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.



**John K. Ford**  
Primary Examiner